Patent Claims

1. A method of cooling a blowing lance for the treatment of a liquid metal melt in a metallurgical vessel, especially steel in a RH vessel optionally subjected to a vacuum and/or for the heating of a metal melt optionally under vacuum, which can be inserted and withdrawn with respect to the interior of the vessel by a lifting device and which has at least one inner guide tube for feeding gases or solids, especially oxygen, with a head-end lance mouth for blowing the gas onto the metal melt, and a cooling jacket extending over its length for the passage therethrough of a cooling medium, and in which the jacket has a double-wall jacket tube forming inner and outer cooling passages with a rerouting tube in the region of the head end, whereby the metallurgical vessel is connected with a pump for pressure reduction therein, characterized in that the instantaneous available suction capacity of the pump limits the maximum flow of the gas used as the cooling medium.

2. The method according to claim 1 characterized in that the instantaneous available pump suction capacity limits the maximum permissible cooling gas flow volume by means of flow measurements and shuts down the cooling gas flow when the instantaneous available pump suction capacity is exceeded.

3. The method according to one of claims 1 or 2 characterized in that as the cooling medium preferably superheated steam, superheated by 20°C to 50°C is used.

4. The method according to one of claims 1 to 3 characterized in that during the oxygen blowing, the cooling medium is fed into the inner cooling passage and discharged through the outer cooling passage.

5. The method according to one of claims 1 to 4 characterized in that in the upper park position of the blowing lance between treatment phases and in VCD operation, the cooling medium is fed into the outer cooling passage and discharged through the inner cooling passage.

6. The method according to one of claims 1 to 5 characterized in that the flow rate of the cooling medium is controlled in dependence upon the measured temperature at the outer periphery of the lance and/or the instantaneous lance position.

7. The method according to one of claims 1 to 7 characterized in that the lance in startup is initially preheated without cooling, preferably in that the lance is fed into the already heated metallurgical vessel and only thereafter is the steam cooling turned on.

8. The method according to one of claims 1 to 7 characterized in that steam at a pressure of at least 7 x 10^5 Pa at a temperature of 160°C to 210°C is fed as the coolant.

9. A device for carrying out the method according to one n of claims 1 to 8 with a metallurgical vessel (200), in which a e blowing lance (10) can be inserted and withdrawn with respect to the vessel interior by means of a lifting device (24) and wherein the lance has at least one inner guide tube (11) with a head-end lance mouth (12) and a cooling jacket (13) which is comprised of an inner cooling passage (15) and an outer cooling passage (16) which are connected through a deflection tube (14) and which also comprises a pump (30) for evacuating the metallurgical vessel (200) through a vacuum fitting (22) characterized by a control unit (27) for adjusting the flow rate of the gas used as the cooling medium whereby the control unit (27) regulates the flow rate of the cooling medium in dependence upon the instantaneous lance position, the suction capacity of the vacuum pump and the measured outer wall temperature of the lance.

10. The device according to claim 9 characterized in that temperature measuring sensors on the blowing lance head and on the jacket of the blowing lance are arranged with longitudinal axial spacing and are connected with the control unit 27.

11. The device according to one of claims 9 or 10 characterized by a condensate separator through which the cooling medium passes before entering the cooling passages.

12. The device according to one of claims 9 to 11 characterized in that the inner surface of the outer cooling jacket tube (13a) turned toward the cooling passage (16) has ribs (19) projecting radially into the cooling channel (16).

13. The device according to one of claims 9 to 12 characterized in that the lance mouth is configured as a Laval nozzle.